Patent claims

1. A method for labeling and identifying solid, liquid and gaseous substances (S1-n),

wherein labeling is carried out by selecting at least one nucleic acid sequence from a first group of predefined nucleic acid sequences (N1-n) having in each case an identification sequence section (IDS1-n) and adding it to the substance (S1-n),

wherein a second group of further nucleic acid sequences (N'1-n) which have in each case a detection sequence section (IDP1-n) complementary to one of the identification sequence sections (IDS1-n) is provided for identification,

wherein first melting points of hybrids formed from the identification sequence sections (IDS1-n) together with the detection sequence sections (IDP1-n) complementary thereto differ by not more than 5°C from one another and

second melting points of not completely complementary hybrids from the identification sequence sections (IDS1-n) and detection sequence sections (IDP1-n) are more than 5°C lower than the lowest of the first melting points and

wherein identification is carried out by contacting the nucleic acid sequence(s) (N1-n) selected from the first group with the further nucleic acid sequences (N'1-n) of the second group under predefined hybridization conditions and detecting hybridization.

2. The method as claimed in claim 1, wherein the identification sequence section (IDS1-n) is

located between two primer binding sequence sections (PBS1, PBS2).

3. The method as claimed in claim 1 or 2, wherein in each case two nucleic acid sequences (N1-n) have a part section (IDS-A, IDS-B) of a common identification sequence section (IDS1-n) at their 5' end and a primer binding sequence section is bound to said part section (IDS-A, IDS-B).

4. The method as claimed in claim 3, wherein the part sections (IDS-A, IDS-B) are partly complementary to one another.

5. The method as claimed in any of the preceding claims, wherein the primer binding sequence sections (PBS1, PBS2) have the same melting point.

6. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are amplified, preferably by means of PCR and by using fluorescent primers.

7. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are linked on at least one end to an agent which counteracts degradation caused by exonuclease.

8. The method as claimed in any of the preceding claims, wherein the nucleic acid sequence (N1-n) is provided with a coupling group (A, B, C, D - Z).

9. The method as claimed in any of the preceding claims, wherein the coupling group (A, B, C, D - Z) is selected from the following group [sic]: biotin group, amino group, thiol group or hapten.

10. The method as claimed in any of the preceding claims, wherein a molecule carrying a fluorophoric group (F11-n) is bound to the nucleic acid sequence (N1-n).

11. The method as claimed in any of the preceding claims, wherein the coupling group (A, B, C, D - Z) is labeled with a fluorophoric group.

12. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are bound to the substance (S1-n) and the substance (S1-n) used is one of the following agents: antibodies, lectins, receptors, nucleotide sequences, PNA sequences, peptides, proteins, sugars, ligands.

13. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are bound to particles (P) or are included therein.

14. The method as claimed in any of the preceding claims, wherein the particles (P) are from 30 nm to 3 mm in size.

15. The method as claimed in any of the preceding claims, wherein the particles (P) are silica, polystyrene, polyvinyl chloride, polyethylene, nylon or glass milk particles.

16. The method as claimed in any of the preceding claims, wherein the particle (P) is a viral capsid or a virus-like particle.

17. The method as claimed in any of the preceding claims, wherein each of the further nucleic acid sequences (N'1-n) is bound to a predefined site on

a solid surface, preferably on a chip, a microtiter plate or film.

18. The method as claimed in any of the preceding claims, wherein hybridization of an identification sequence section (IDS1-n) with a complementary detection sequence section (IDP1-n) is detected by means of fluorescence.

19. The method as claimed in any of the preceding claims, wherein at least two nucleic acid sequences (N1-n) are added to the substance (S1-n) as a label.

20. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) and/or the further nucleic acid sequences (N'1-n) are prepared synthetically.

21. The method as claimed in any of the preceding claims, wherein chimeras of nucleic acids and nucleic acid analogs, such as PTO or PNA, are used instead of the nucleic acid sequences or the further nucleic acid sequences.